

REMARKS

These remarks address the rejections set forth in the recent Office Action mailed October 30, 2007. Claims 14-17 and 29-46 are pending in this application. Claims 14-17, 29-33, 35-39, 41-44 and 46 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,056,021 ("Ausborn"). Claims 34, 40 and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ausborn in view of U.S. Patent 4,384,329 (Rosenbaum). The Office's positions regarding the patentability of the pending claims are confusing and contradictory. The rejections set forth in the recent Office Action are vague in that the Examiner at best merely cites to passages of the cited art to show various claim limitations. The Examiner makes no attempt to explain how the cited passages actually show or suggest the claim limitations of applicants' invention. These vague rejections would be troublesome for any applicant, but are particularly egregious in light of the history of this prosecution, which is set forth below.

I. PROSECUTION HISTORY

This application was filed April 17, 2001, with claims 1-28. In an Office Action mailed October 19, 2004, independent claims 1, 8, 14, 18, 21, and 24 (pending claims 29, 36 and 42 correspond to original claims 1, 8 and 24) were rejected as being anticipated by Ausborn. The dependent claims were rejected as being anticipated by Ausborn or as being unpatentable over Ausborn in view of U.S. Patent 6,332,143. On April 19, 2005, Applicants filed a response explaining why the pending claims are patentable over Ausborn. The Office responded with a second non-final Office Action mailed October 6, 2005, which found Applicants' arguments persuasive. The Office found the claims patentable over Ausborn:

at least because Ausborn does not: group a plurality of roots selected from a set of roots to form a word (claim 1), represent all concepts (claim 8), have a root including a most significant field in which the readable value designates a general abstract concept and field in which the readable value designates a narrower concept (claim 14, wherein the readable values are identical), have an each field represented by bits of data forming words (claim 18), have a plurality of fields representing subclass of general abstract class of ideas (claim 21), have each word root forming the word (claim 24).

October 2005 Office Action at 2.

The October 2005 Office Action objected to the specification, drawings and claims. Claims 1-13, 18 and 24-28 were rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement. Claims 6, 12, 14-23, 27 and 28 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In a response mailed April 6, 2006, Applicants amended the specification and claims and, further, explained how the claims as amended complied with the requirements of 35 U.S.C. § 112.

On July 3, 2006, after the substantial examination of all of claims 1-28 discussed above, the Examiner issued a written restriction requirement asserting that claims 1-17 and 24-28 were drawn to a distinct invention from claims 18-23. On August 3, 2006, Applicants elected the invention of claims 1-17 and 24-28 for further prosecution. On October 18, 2006, the Examiner mailed a third non-final Office Action in which the rejection of claims 1-13 and 24-28 under 35 U.S.C. § 112, first paragraph, was maintained. However, the Examiner indicated that claims 14-17 were allowed. In response, on January 18, 2007, Applicants filed an amendment cancelling the rejected claims to place this application in condition for allowance. On March 29, 2007, the Examiner rejected claims 14-17 under 35 U.S.C. § 101 as directed to non-statutory subject matter. In response, applicants on August 29, 2007, amended claim 14 to overcome the rejection under Section 101. Applicants further reinstated original claims 1-13 and 24-28 as new claims 29-46 in view of the withdrawal of the indication of allowable subject matter of claims 14-17.

In response, the Examiner has apparently found applicants' arguments with respect to the prior rejections under 35 U.S.C. § 101 and under the first paragraph of 35 U.S.C. § 112 persuasive, as these rejections have not been repeated in the recent Office Action. The Examiner has, however, again rejected the independent claims 14, 29, 36 and 42 (corresponding to original claims 14, 1, 8 and 24) as being anticipated by Ausborn.

Piecemeal examination should be avoided as much as possible.
The examiner ordinarily should reject each claim on all valid grounds.

M.P.E.P. § 707.07(g). The rejections under 35 U.S.C. §§ 101, 102, 103 and 112 could all have been presented in the initial Office Action. Instead, the Office has unreasonably delayed this prosecution by spreading these rejections over five actions spanning over three years. The

restriction requirement could have preceded the initial action on the merits, but was rather presented in middle of prosecution. Now, three years later, this prosecution is back where it started with the claims rejected over the primary reference to Ausborn. There is no justification for this unreasonable delay in the prosecution of this application.

Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it.

M.P.E.P. § 707.07(f). Applicants set forth distinctions between the claimed subject matter and the teaching of Ausborn in the April 2005 Response. The Office set forth the reasons that the claims are patentable over Ausborn in the October 2005 Office Action. The Examiner fails to address either the applicants' arguments or the Office's prior indication of why Ausborn fails to anticipate the claims. The vague rejections set forth in the recent Office Action do nothing to explain why the earlier indication that these claims are patentable over Ausborn is in error. As the Examiner has indicated no errors in the prior prosecution history, applicants do not understand why the claims are not considered patentable over Ausborn. With all due respect, applicants submit that the pending claims are patentable for reasons set forth in April 2005 Response and the October 2005 Office Action.

II. AMENDMENTS

Claims 16, 39, and 40 are amended to correct minor errors of form. Claim 16 refers to the predetermined set of roots without proper antecedent. Claim 16 is amended to depend from claim 15 which introduces the predetermined set of roots. Claim 39 and 40 are amended to correct grammatical errors.

III. AUSBORN FAILS TO ANTICIPATE CLAIMED INVENTION

Ausborn fails to anticipate the pending claims. Applicants' invention and the invention of Ausborn address nearly diametrically opposed problems. Conventional natural language and machine processing are nearly incompatible. A significant problem with machine processing of natural language is the ambiguities present in natural languages. These ambiguities arise in part because human language evolved to enable the oral transfer of concepts. The written word is primarily a representation of the oral pronunciation of spoken words. Thus, the syntax of natural languages are too flexible to be easily processed by machine and the words

of natural languages are too ambiguous to easily processed by machine. This creates two significant problems. First, machines are unable to easily transfer, store and process information related to the entire realm of knowledge that is conveniently and flexibly represented by natural languages. Second, machines are unable to interpret human communications that are presented in natural language. Applicants' invention addresses the first problem. Ausborn addresses the second problem.

Applicants' invention "provides a system and method for storing and processing words of a vocabulary that is structured to represent all concepts in a manner that the words are easily stored a processed by machine." (Summary of the Invention [1].) "Each word is easily represented in the number of bits contained by a processor register. A computer programmed to recognize the meaning of words presented in this form is capable of quickly determining the meaning of the word." (Summary of the Invention [7].) Applicants' invention, thus, provides a vocabulary that represents complex concepts and is easily interpreted my machine. This is in stark contrast to conventional natural language, which is readily interpreted by humans, but is nearly impossible for machines to interpret.

Ausborn does not provide a vocabulary that is easily interpreted by machine. Rather, Ausborn provides a "system for abstracting concepts from natural language." Ausborn 1:6-7. In particular, Ausborn addresses the issue that many natural language words are ambiguous. When looking up the meaning of word, typically there are multiple meanings. Ausborn provides a system for determining which oncs of the many meaning are applicable in a sequence of words or phrase. Ausborn 3:35-37. Ausborn notes that in *Roget's Thesaurus* each meaning of each English word is provided at each of four levels of abstraction. Ausborn 3:49-60. Ausborn then notes:

The inventor has determined that using this hierarchy allows each word in a phrase of a natural language to be grouped according to its meaning. Each "word" in a phrase can be analyzed to determine the appropriate categories of meaning form the Roget's classification that apply thereto. These categories of meaning from the four levels of abstraction are determined and stored as functions of their levels of abstraction. When the entire phrase has been analyzed, common categories of meaning within levels of abstraction are determined and assigned a certainty value based on

how many times they occur. If any two words in the phrase have a common category of meaning with any level of abstraction, there is a high probability that this is a meaning behind these words when used in the phrase.

Ausborn 4:38-52.

Ausborn does not present a machine readable vocabulary or a method of representing concepts using a machine readable vocabulary as set forth by the present claims. As noted above, the categories of meaning from the four levels of abstraction are stored as an intermediate step of the Ausborn invention. However, this storage of all possible meanings of words of a phrase does not anticipate the claimed machine readable vocabulary of the claimed invention. Applicants' respectfully submit that Ausborn does not teach each limitation of the rejected claims. The Examiner's bare references to passages of Ausborn fail to explain how Ausborn teaches the limitation of the rejected claims.

A. Claim 14

Claim 14 was indicated to be allowable over Ausborn in the October 2005 Office Action. Claim 14 sets forth a machine readable medium on which is stored a data structure. The data structure includes:

- A word including a plurality of roots
- A plurality of roots each including a fixed number of a plurality of fields, and
- A plurality of fields.

As noted above, Ausborn stores the categories of meaning from the four levels of abstraction as an intermediate step of the invention. These categories of meaning are stored in an array. Ausborn 6:36-41. The Examiner appears to rely on the entries in this array to show the fields of claim 14. It is however, not clear what teaching the Examiner relies upon to show the roots of claim 14. The Examiner refers to Fig. 1, to the array as shown at 304 of Fig. 3 and to the array as shown at 404 of Fig. 4. These references demonstrate that an array is generated for each particular word being processed by the Ausborn system. Thus, each word is represented by the entries in the Ausborn array. There are, thus, no roots as set forth by claim 14

in the Ausborn array. Rather, the entries in the array of Ausborn directly correspond to the word being analyzed by the Ausborn system. For at least this reason, Ausborn fails to anticipate claim 14.

B. Claims 15-17

Claims 15-17 depend from claim 14. Ausborn does not anticipate claims 15-17 for at least the reasons set forth above.

1. Claim 15

Claim 15 sets forth that the plurality of roots are selected from a predetermined set of roots. The Examiner refers to the Appendix of Ausborn to show a set of predetermined roots. However, each root includes a fixed number of the plurality of fields as set forth by claim 14. The entries in the Appendix of Ausborn do not each include a fixed number of a plurality of fields. Ausborn fails to anticipate claim 15 for at least this reason.

2. Claim 16

Claim 16 depends from claim 15. Ausborn fails to anticipate claim 16 for at least the reasons set forth above with respect to claim 15. Claim 16 sets forth that the readable value of the most significant field designates a concept at a highest level of a tree-type structure on which the predetermined set of roots is based. The readable value of the field of lesser significance designates a concept at a lower level of the tree type structure. The Examiner refers to the array of Ausborn to show fields designating levels of concepts from a tree-type structure. The array of Ausborn includes entries from the pre-stored database as illustrated in the Ausborn Appendix. Ausborn 6:36-39. The fields of the claimed invention make up roots selected from a predetermined set of roots. In Ausborn to the contrary, the array is filled with fields selected from a pre-stored database. Ausborn fails to anticipate claim 16 for at least this reason.

3. Claim 17

Claim 17 sets forth that the word includes a further root designating how the word is used. The Examiner cites to column 9, lines 4-45 of Ausborn to teach this claim limitations. The Examiner asserts that the cited passage teaches levels of abstraction indicating how the word is used. Again, it is unclear what teaching the Examiner relies upon to show the roots of the

claimed invention. However, the cited passage does not address designating how a word is used. Rather, the cited passage of Ausborn shows how a natural language phrase is analyzed and processed. The levels of abstraction of Ausborn do not comprise a root that designates how a word is used. For at least this reason Ausborn fails to anticipate claim 17.

C. Claim 29

Claim 29 corresponds to original claim 1 which was indicated to be allowable over Ausborn in the October 2005 Office Action. Claim 29 sets forth representing each root of a set of roots with a value. Each root includes a plurality of common fields. Data concepts are represented by grouping a plurality of roots to form a word. The Examiner fails to explain where Ausborn teaches fields, roots and words. In fact the Examiner for the most part merely refers to claim 14. As discussed with respect to claim 14, the Ausborn system creates an array of entries for each word analyzed by the system. At best Ausborn show arrays and array entries. The Examiner fails to explain how these arrays and array entries teach fields, roots and words. Ausborn does not teach words formed from roots that in turn include a plurality of common fields. For at least this reason, Ausborn fails to anticipate claim 29.

D. Claims 30-33 and 35

Claims 30-33 and 35 depend from claim 29. Ausborn fails to anticipate claims 30-33 and 35 for at least the reasons set forth with respect to claim 29.

I. Claim 30

Claim 30 depends for claim 29 and sets forth that each word includes a number of bits equal to a number of bits contained in processor register of a computer for processing the word. Accordingly, each word processed by the same processor has an equal bit length (for example, 64 bits as disclosed in the specification). The Examiner asserts that this is inherent to the machine recognition of the words in Ausborn. There is no support for this assertion. There is no data structure taught by Ausborn that includes a number of bits equal to the bits contained in a processor register. It is unclear exactly what the Examiner relies upon to teach the word of the claimed invention. It appears that the Examiner relies on the array of Ausborn. There is no reason that each array processed by the Ausborn system has a number of bits equal to the processor register. There is in fact no reason that each array should have an equal number of

bits. As shown in Table 1 of Ausborn, each word has a varying number of entries in its array and thus will be of varying lengths. For at least these reasons, Ausborn fails to anticipate claim 30.

2. Claims 32 and 33

Claim 33 sets forth that a characteristic designated by certain roots is defined based on values assigned to more basic roots. The Examiner asserts that this is inherent to a hierarchical level and structured array. However, the roots of the claimed invention are made of fields organized in a hierarchical tree-type structure. The roots themselves do not exist at different levels of the hierarchy. Rather, each root includes fields that exist at different levels of the hierarchy. Accordingly, it is not inherent that the characteristic of any particular root making up a word is defined based on any other root. Ausborn includes no roots that are defined based on values assigned to more basic roots.

Claim 32 sets forth that certain roots are conventionalized based on values assigned to more basic roots. As explained above with respect to claim 33, Ausborn includes no roots that are defined based on values assigned to more basic roots. Ausborn does not, therefore, teach roots that are conventionalized based on values assigned to more basic roots.

3. Claim 35

Claim 35 sets forth that the word includes a connotative root indicating how the word is used. The Examiner cites to column 9, lines 4-45 of Ausborn to teach this claim limitation. The Examiner asserts that the cited passage teaches levels of abstraction indicating how the word is used. Again, it is unclear what teaching the Examiner relies upon to show the roots of the claimed invention. However, the cited passage does not address indicating how a word is used. Rather, the cited passage of Ausborn shows how a natural language phrase is analyzed and processed. The levels of abstraction of Ausborn do not comprise a root that indicates how a word is used. For at least this reason Ausborn fails to anticipate claim 35.

E. Claim 36

Claim 36 corresponds to original claim 8 which was indicated to be allowable over Ausborn in the October 2005 Office Action. Claim 36 sets forth a method in which each

particular concept is represented by a plurality of roots, each root representing a characteristic of the particular concept being represented. Each root is represented with a plurality of fields designating a meaning of the root with respect to a definitional tree-type structure.

The Examiner relies on the hierarchy of concept representation of Fig. 1 of Ausborn to teach representing each concept with a plurality of roots. Figure 1 is an example of Roget's classification system. Each word in natural language is classified into categories of meaning with each of the four levels of abstraction. Applicants note each root of the claimed invention does not represent a meaning of the concept with respect to a level of abstraction. Rather each field representing a root does.

The Examiner relies on the array structure of Ausborn to show representing each root with a plurality of fields. However, the array structure of Ausborn is simply the tangible application of Roget's classification system shown in Fig. 1. The entries in the array of Ausborn are selected from the classification structure of Fig. 1. Ausborn 6:36-41. Thus, the Examiner relies on the same entries of Ausborn to teach both the roots and the fields of the claimed invention. Ausborn, thus, does not teach both fields and roots that are represented with a plurality of fields. For at least this reason, Ausborn does not anticipate claim 36.

F. Claims 37-39 and 41

Claims 37-39 and 41 depend from claim 36. Ausborn fails to anticipate claims 37-39 and 41 for at least the reasons set forth with respect to claim 36.

1. Claim 37

Claim 37 sets forth that each field includes at least one bit and each plurality of roots representing a concept is included in a word having a number of bits equivalent to a number of bits contained in a processor register of a computer for processing the word. The Examiner asserts that this is inherent to the machine recognition of the words in Ausborn. There is no support for this assertion. There no data structure taught by Ausborn that includes a number of bits equal to the bits contained in a processor register. For at least these reasons, Ausborn fails to anticipate claim 37.

2. Claims 38 and 39

Claim 39 as amended sets forth that a characteristic designated by a certain root is defined based on contents of the fields of at least one other root. The Examiner asserts that this is inherent to a hierarchical level and structured array. However, the roots of the claimed invention are made of fields organized in a hierarchical tree-type structure. The roots themselves do not exist at different levels of the hierarchy. Rather, each root includes fields that exist at different levels of the hierarchy. Accordingly, it is not inherent that the characteristic of any particular root is defined based on any other root. Ausborn includes no roots that are defined based on values assigned to more basic roots.

Claim 38 sets forth that a certain root is conventionalized based on contents of the fields of an other root. As explained above with respect to claim 39, Ausborn includes no roots that are defined based on the fields of other roots. Ausborn does not, therefore, teach roots that are conventionalized based on the contents of the fields of other roots.

3. Claim 41

Claim 41 sets forth representing each particular concept with a further root that represents a connotation of the particular concept represented. The Examiner cites to column 9, lines 4-45 of Ausborn to teach this claim limitation. The Examiner asserts that the cited passage teaches levels of abstraction indicating how the word is used. Again, it is unclear what teaching the Examiner relies upon to show the roots of the claimed invention. However, the cited passage does not address indicating a connotation of a concept. Rather, the cited passage of Ausborn shows how a natural language phrase is analyzed and processed. The levels of abstraction of Ausborn do not comprise a root that indicates connotation of a concept. For at least this reason Ausborn fails to anticipate claim 41.

G. Claim 42

Claim 42 corresponds to original claim 24 which was indicated to be allowable over Ausborn in the October 2005 Office Action. Claim 42 sets forth forming a tree-type taxonomy for word roots where each level of the taxonomy is represented by a field in each word root. A plurality of the word root are combined to form a word with each word root representing a characteristic of the word.

The Examiner relies on the array discussion of claim 29 to show each level of the taxonomy represented by a field in each word root. The Examiner also relies on the discussion of claim 29 to show combining a plurality of word roots to form a word. However, in the discussion of claim 29 the array of Ausborn is relied upon to show grouping roots to form words. Ausborn does not teach both the fields and roots of the claimed invention. For at least this reason, Ausborn does not anticipate claim 42.

H. Claims 43, 44 and 46

Claims 43, 44 and 46 depend from claim 42. Ausborn fails to anticipate claims 43, 44 and 46 for at least the reasons set forth above with respect to claim 42.

I. Claim 43

Claim 43 sets forth that the taxonomy for word roots includes conventions whereby the class and subclasses represented by fields of a word root are altered based on the fields of other word roots combined with the word root to form the word. The Examiner appears to assert that the array entries of Ausborn, which are relied upon to show the fields of the claimed invention, are altered based on the fields of higher levels of classification. However, claim 43 sets forth that the class and subclass are altered based on the fields of *other* word roots, not fields of higher levels of the same root. There is no teaching in Ausborn that the class and subclass of any root are altered based on fields of *other* word roots.

2. Claim 44

Claim 44 sets forth that the characteristic represented by at least one root combined to form the word is designated by reference to another root combined to form the word. The Examiner asserts that the word roots are referenced through the hierarchy of Ausborn. However, claim 44 does not set forth that the characteristic represented by the root is designated by the tree-type taxonomy. Rather, the characteristic is designated by reference to another root. Accordingly, the classification hierarchy of Ausborn is insufficient to show the limitations of claim 44.

3. Claim 46

Claim 46 sets forth a further word root that represents how the word is used. The Examiner that the final category root in the array of Ausborn is an indicator. Ausborn includes no such teaching. Furthermore, here the Examiner appears to imply that the array is made up of roots from the classification categories of Ausborn. However, the word roots of the claimed invention include fields which represent each level of the taxonomy. If the array entries of Ausborn are relied upon to show the roots of the claimed invention, then it is unclear what element taught by Ausborn is relied upon to show the fields in each word root.

IV. AUSBORN IN VIEW OF ROSENBAUM FAILS TO RENDER THE CLAIMED INVENTION OBVIOUS

Claims 34, 40 and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ausborn in view of Rosenbaum. Claims 34, 40 and 45 depend from claims 29, 36 and 42 respectively. As Ausborn fails to teach or show each limitation of the independent claims from which claims 34, 40 and 45 depend Ausborn fails to teach or show each limitation of these claims. Rosenbaum fails to correct for the deficiencies of Ausborn discussed above with respect to claims 29, 36 and 42. For at least this reason, claims 34, 40 and 45 are patentable over Ausborn in view of Rosenbaum *et al.*

Each of claims 34, 40 and 45 are directed to indicating that a root is to be interpreted negatively. The Examiner asserts that Rosenbaum suggests a binary antonymic relationship of a word as a value associated with the word. Rosenbaum is directed to the retrieval of synonyms and antonyms during document preparation. Rosenbaum 1:8-12. Rosenbaum employs a binary vocabulary matrix ("BVM") in which the relationship of every word in the vocabulary is associated with every other word in the vocabulary. Rosenbaum 2:44-47. The BVM is organized as a N×N matrix. Rosenbaum 3:11-12. The relationship between words in either "on," when they are synonyms, or "off," when they are not. Rosenbaum 3:19-20. A similar table may be created to relate antonyms. Rosenbaum 3:27-29. The entries in the Rosenbaum BVM do not designate the meaning of any word. Rather the entries in the BVM relate two words as either synonyms or antonyms. Accordingly, Rosenbaum fails to teach or suggest the limitations of claims 34, 40 and 45.

There is no reason found in the prior art or within the knowledge of one of ordinary skill in the art to combine the teaching of Ausborn and Rosenbaum. The Examiner asserts that it would have been obvious to modify Ausborn's tree-type structure with a root indicating opposite meaning in value. The Examiner fails to explain how to modify Ausborn's tree-type structure with the teaching of Rosenbaum's $N \times N$ matrix. There is no suggestion in the prior art or within the knowledge of one of ordinary skill in the art how such different structures could be combined. The Examiner asserts that the proposed modification of Ausborn's tree-type structure provides the benefit of reducing storage space. Applicants do not understand how adding any elements of the Rosenbaum BVM to the Ausborn tree-type structure would result in reducing storage space. In fact, Rosenbaum explains that to find antonyms *an entire separate* BVM memory structure is required. Rosenbaum 3:27-29. Accordingly, there is no support for the Examiner's contention that the indications of negative meaning taught by Rosenbaum provide the benefit of reducing storage space. One of ordinary skill in the art would find no reason to combine the teachings of Ausborn and Rosenbaum.

V. CONCLUSION

Applicant believes the pending application is in condition for allowance, as the claims have been demonstrated to be patentable over the primary reference to Ausborn.

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Respectfully submitted,

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